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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,914	02/12/2002	Mostafa Rassaian	38190/235965	8444

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EXAMINER	
LEVIN, NAUM B	
ART UNIT	**PAPER NUMBER**
2825	

DATE MAILED: 08/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,914	RASSAIAN, MOSTAFA	
	Examiner	Art Unit	
	Naum B Levin	2825	

-- The MAILING DATE of this communication appears on the cover sheet with th correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-66* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,23-34 and 45-56* is/are rejected.

7)☒ Claim(s) *13-22,35-44 and 57-66* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. This office action is in response to application 10/074,914 and Response filed on 06/27/2003. Claims 1-66 remain pending in the application.

Examiner appreciates the detailed remarks offered by Applicant. Based on it Examiner has performed additional search, and found a new references.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-12, 23-34 and 45-56 are rejected under 35 U.S.C. 102(b) as being unpatentable over Shebini (US Patent 4,858,146).

Shebini teaches automated design of structures using a finite element database including:

(1), (23), (45) A method, system and program for design analysis of a structural component, the method comprising (col.7, ll.57-60; col.9, ll.40-45; col.10, ll.49-52; col.11, ll.19-28 and ll.51-57; col.33, ll.10-24 and col.34, ll.18-27):

generating a finite element model of the component (col.2, ll.1-28; col.10, ll.52-55 and col.32, ll.36-47);

receiving user-defined parameters defining a plurality of stresses associated with the component and including at least one thermo-mechanical environment parameter (col.4, ll.21-39; col.7, ll.40-51 and col.17, ll.40-65);

subjecting/applying the finite element model of the component to at least one environmental load (col.2, ll.29-37 and col.4, ll.21-39);

determining a stress response of the finite element model based upon the at least one environmental load (col.5, ll.26-45; col.8, ll.65-68 and col.11, ll.19-28);

determining whether the stress response is within pre-selected limits (col.4, ll.65-68; col.5, ll.1-45 and col.11, ll.29-38); and

prompting modification of at least one of a design of the component and at least one user-defined parameter and regenerating the finite element model if the stress response is outside of the pre-selected limits (col.4, ll.65-68; col.5, ll. 1-25 and col.32, ll.52-64);

(2), (25), (46) The method, system and program, wherein determining whether the stress response is within pre-selected limits comprises converting the stress response of the finite element model to a fatigue life for the component and comparing the fatigue life for the component to a target fatigue life for the component (col.5, ll.26-45 and col.7, ll.39-50);

(3), (26), (47) The method, system and program, wherein prompting modification comprises determining at least one of the design of the component and at least one user defined parameter that causes the fatigue life for the component to be shorter

than the target fatigue life for the component, if the fatigue life for the component is shorter than the target fatigue life for the component (col.5, ll.26-45 and col.7, ll.39-50);

(4), (32), (53) The method, system and program further comprising creating a drawing of a design of the component prior to generating the finite element model of the component (col.9, ll.58-68; col.10, ll.1-16 and ll.40-55);

(5), (33), (54) The method, system and program, wherein creating the drawing of the design of the component comprises creating a three-dimensional computer aided drawing of the design of the component (col.10, ll.52-55);

(6), (34), (55) The method , system and program, wherein creating the drawing of the design of the component comprises creating a drawing of a design of electronics embedded in the component (col.5, ll.46-60);

(7), (27), (48)The method, system and program, wherein receiving user-defined parameters defining a plurality of variables associated with the component comprises receiving at least one of at least one manufacturing parameter for the component, at least one boundary condition for the component, and part information for the component (col.2, ll.1-5; col.3, ll.28-48);

(8), (28), (49) The method, system and program, wherein receiving at least one thermo mechanical environment parameter for the component comprises receiving at least one of a thermal environment parameter, an acoustic environment parameter, a vibration environment parameter, and a shock environment parameter (col.4, ll.21-38 and col.11, ll.19-28);

(9), (29), (50) The method, system and program further comprising receiving finite element properties and information regarding at least one part of the component (col.2, ll.1-5);

(10), (30), (51) The method, system and program, wherein receiving information regarding at least one part of the component comprises receiving information from a database of parts information (col.10, ll.5-12 and ll.43-48);

(11), (31), (52) The method, system and program, wherein subjecting the finite element model of the component to at least one environmental load comprises subjecting the finite element model of the component to at least one of a thermal environmental load, an acoustic environmental load, a vibration environmental load, and a shock environmental load (col.2, ll.29-37; col.4, ll.21-39 and col.11, ll.19-28);

(12), (24), (56) The method, system and program further comprising storing the finite element model as a representation of the design for the component if the stress response is within the pre-selected limits (col.4, ll.65-68; col.5, ll.1-25; col.31, ll.62-68 and col.32, ll.1-10).

Allowable Subject Matter

4. Claims 13-22, 35-44 and 57-66 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record fails to teach or suggest or render obvious:

A method for design analysis of a structural component, wherein subjecting the finite element model of the component to at least one environmental load comprises: subjecting the finite element model of the component to a computational first load; subjecting the finite element model of the component to a computational second load; determining a maximum response of the finite element model of the component to the first load; determining a maximum response of the finite element model of the component to the second load; determining a ratio of the maximum responses; obtaining a first environmental load to test against the component; applying the ratio of the maximum responses to the first environmental load to convert the first environmental load to a second environmental load; and subjecting the finite element model to the second environmental load.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Biggs et al. (US Patent 6,301,970) discloses a method of predicting fatigue failure in a filled polymeric material is provided. The method involves the calculation of stress at the region of highest stress using an equation which includes as parameters, egression coefficients of the stress vs. modulus obtained from a finite element analysis. Once the regression coefficients are obtained, there is no further need to perform a finite element analysis. The calculated stresses are numerically integrated in

a damage equation using a Monte Carlo method, using a cumulative model to estimate when failure will occur. The method has been tested in the case of temperature stress loading of a solid propellant rocket motor.

Huang et al. (US Patent 6,212,486) teaches a method of dynamic durability analysis and fatigue area identification using modal techniques for a structure includes the steps of simulating a finite element model of the structure to determine modal stresses and modal displacements for an element of the structure and performing a modal transient analysis using the modal displacements. The method also includes the steps of determining a stress bound for the element from the modal stresses and modal transient analysis, determining if a stress bound for the element is greater than a predetermined value and identifying the element as a critical element if the stress bound for the element is greater than the predetermined value. The method further includes the steps of determining a stress time history for the critical element and using the stress time history to perform a fatigue analysis to identify an area of fatigue within the structure.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naum B Levin whose telephone number is 703-305-0144. The examiner can normally be reached on M-F (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 703-308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are 703-

872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

N L
August 7, 2003

LEIGH M. GARBOWSKI
PRIMARY EXAMINER